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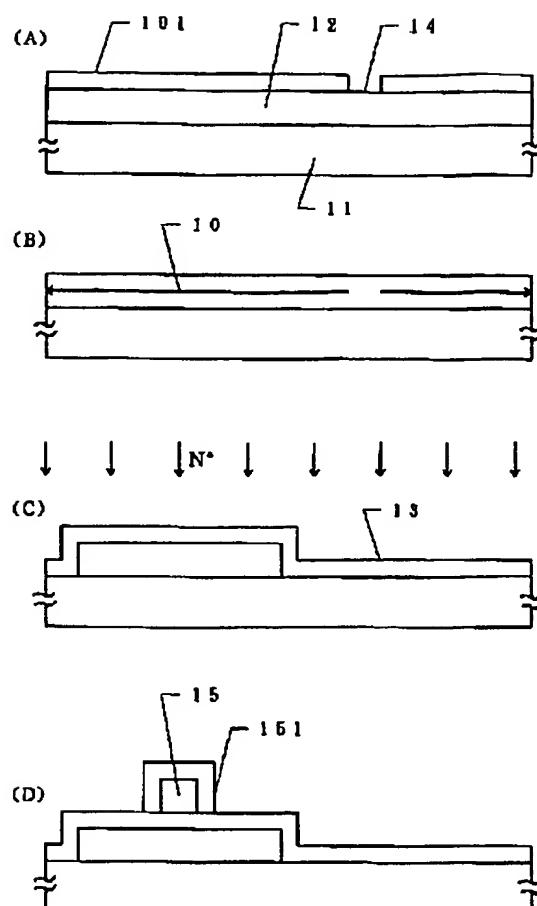
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APPLICANT : SEMICONDUCTOR ENERGY LAB CO LTD;

INVENTOR : CHO KOYU;

INT.CL. : H01L 29/786 H01L 21/336 H01L 21/318

TITLE : SEMICONDUCTOR DEVICE AND ITS MANUFACTURE



ABSTRACT : PROBLEM TO BE SOLVED: To make an insulation film dense and also improve its dielectric constant by implanting nitrogen ions into the surface of an insulation film comprised of silicon oxide film which is formed on a semiconductor and nitriding the surface thereof.

SOLUTION: A silicon oxide film as a base is formed on a glass substrate 11 by the sputtering method, and an amorphous silicon film 12 is formed by the plasma CVD method, thereby forming a silicon oxide film 101 as a mask. It is heated and annealed in an inert atmosphere for crystallization. Further, a silicon oxide film 13 is formed as a gate insulation film, and nitrogen ions are implanted therein to change the surface of the silicon oxide film into nitrogen oxide silicon. Thus, the dielectric constant of the nitrogen oxide silicon film 13 comprising the gate insulation film can be made larger than that of the silicon oxide film, so that the film itself can be made rigid and dense.

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